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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Arthur J. Carlson

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EXAMINER

PERILLA, JASON M

ART UNIT

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 09/882,100	<b>Applicant(s)</b> CARLSON, ARTHUR J.	
	<b>Examiner</b> JASON M. PERILLA	<b>Art Unit</b> 2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 04 June 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 June 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

1. Claims 1-22 are pending in the instant application.

#### ***Response to Arguments***

2. In view of the appeal brief filed on June 4, 2008, PROSECUTION IS HEREBY REOPENED. New rejections are set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,

(2) initiate a new appeal by filing a notice of appeal under 37 CFR 41.31 followed by an appeal brief under 37 CFR 41.37. The previously paid notice of appeal fee and appeal brief fee can be applied to the new appeal. If, however, the appeal fees set forth in 37 CFR 41.20 have been increased since they were previously paid, then appellant must pay the difference between the increased fees and the amount previously paid.

A Supervisory Patent Examiner (SPE) has approved of reopening prosecution by signing below:

3. The Applicant's arguments against the prior art rejections of claims 1-22 as being unpatentable over Bremer et al (US 6546090; "Bremer") in view of Dirschedl et al (US 6262994; "Dirschedl"), and in further view of Gross et al (6,549,520; hereafter "Gross") have been reconsidered.

The Applicant's first argument is that the prior art of record discloses determining an error rate and not, specifically, a data rate. While it is admitted that Dirschedl

discloses determining an error rate rather than a data rate, the Examiner has provided a proper *prima facie* case of obviousness including the prior art reference Gross which cures the deficiency. The Applicant notes that an error rate and a data rate are not specifically equivalent, *but the Applicant has conceded Gross's teaching that "an error rate can have an effect on the maximum data rate that can be achieved in a system"*. Therefore, Gross illuminates what is already notoriously known in the art of data communication. That is, the fact that *a maximum receive data rate* is commonly generated from a determined error rate.

It is noted that as originally filed, claim 1 provided for "obtaining information regarding the data rate". By the Applicant's amendment of September 18, 2006, "obtaining information regarding a data rate" was amended to simply "obtaining a data rate". According to the specification as originally filed, the claimed "obtaining a data rate" references not the determination of a "data rate transmitted". Rather, it refers to a ***maximum receive data rate*** which may be obtained from "information regarding a data rate". (Specification; pg. 3, ¶ 2). It would be nonsensical to consider that the claimed "obtaining a data rate" was limited to determining the data rate actually transmitted from the transmitter to the receiver. (Moreover, for the Applicant to suggest as much would constitute new matter in the application.) The data rate transmitted is already predetermined knowledge in the system and would be of inconsequential value to recalculate.

While the prior art reference Dirschedl discloses determining an error rate (i.e. *information regarding a data rate*), the prior art reference Gross discloses obtaining ". . .

the **maximum data rate** that can be provided for the particular communications subchannel, subject to predefined constraints such as maximum bit error rate . . . etc.” (col. 4, lines 30-35). Therefore, in as much as the prior art combination discloses the very invention claimed and combination of references represents a proper one, the limitation including “obtaining a data rate” is disclosed by the prior art.

The Applicant’s second argument is that Dirschedl doesn’t disclose “forming symbols using a *predetermined number* of bits per symbol if the data rate is above the threshold; and allowing symbols to be formed using *any integer number* of bits per symbol is the data rate is below the threshold.” Because the Applicant’s arguments are persuasive on the point, new prior art rejections are set forth below. However, it is noted that the Applicant’s invention must be limited to those embodiments which the disclosure enables. Taken literally, the generation of any integer number of bits per symbol is not enabled. For instance, the generation of a 32 bit symbol would require  $2^{32}$ PSK or 4294967296PSK which is not enabled by the standards of the current state of the art or by the disclosure of the instant invention.

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-22 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Dirschedl et al (US 6262994; “Dirschedl” – previously cited) in view of Gross et al

(6,549,520; hereafter "Gross" – previously cited) and Jones (U.S. Pub. No. 2002/0106010 – newly cited).

Regarding claim 1, Dirschedl teaches a method of restricting symbol size in an system (abstract; col. 1, lines 40-55) comprising: obtaining information regarding the data rate during initialization (col. 2, line 63 – col. 3, line 9); comparing the information to a threshold or "preset value" (col. 3, lines 13-25); forming symbols (i.e. 3 bit symbols using 8 PSK) using a multiple (i.e. 3) of a predetermined number (i.e. 1) of bits if the information is above the threshold (col. 3, line 20); and allowing symbols to be formed using an integer number of bits per symbol (i.e. the integer number is 1) to create either 1 ("2PSK") or two ("4PSK") bit symbols if the information is below the threshold (col. 3, line 15). Dirschedl teaches a method wherein an error rate is determined (col. 2, lines 63-68) and a data transmission rate is undated accordingly. A success/fail determination or threshold is compared at the transmitter to determine the quality of the transmission (col. 3, lines 13-25). According to the success/fail determination, the number of bits per symbol is updated according to the possible bit rates of, at least, 1, 2, or 3 bits per symbol at the transmitter. Dirschedl does not explicitly disclose that the determined error rate *is a maximum received data rate*. However, Gross teaches that information regarding a data rate (or an error rate) may be used to calculate a maximum receive data rate (col. 4, lines 29-33). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to rely on the information regarding a data rate (i.e. error rate) to determine a maximum receive data rate because determining a maximum receive data rate would be within the level of

ordinary skill in the art and a metric which is of benefit to the system as suggested by Gross. In the combination of Dirschedl in view of Gross, the application of Dirschedl's threshold or "preset value" would be flipped such that large maximum data rates exceeding the threshold would facilitate the use of 8PSK and low maximum data rates below the threshold would only permit the use of 2 or 4PSK.

Further regarding claim 1, Dirschedl does not explicitly disclose applying the method in an ADSL system. However, ADSL systems are notoriously known in the art and Jones discloses an adaptive rate method in an ADSL system (§ 0005). Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made that Dirschedl's method could be applied in an ADSL system as suggested by Jones because Dirschedl's method is readily applicable in any system and ADSL systems are ubiquitous in the field of digital communication. Moreover, the use of Dirschedl's method in Jones' ADSL system would produce only routine and predictable results and is well within the ability of one having ordinary skill in the art.

Finally regarding claim 1, Dirschedl in view of Gross and Jones do not explicitly disclose that if the maximum receive data rate is below the predetermined threshold, symbols are formed using *any* integer number of bits per symbol. Rather, the combination (according primarily to Dirschedl), at most, provides for the formation of either 1 or 2 bit symbols (i.e. 2PSK or 4PSK) if the maximum receive data rate is below the threshold but not the formation of 3, 4, 5, etc. bit symbols. However, the formation of symbols having a variable (i.e. any) integer number of bits depending upon a received signal's SNR is disclosed by Jones (§ 0035). Jones discloses that, in the prior

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art, "no attempt is made to optimize symbol rate, center frequency and constellation size for more efficient bandwidth utilization or bit rate enhancement" (§ 0033). Jones teaches using a variable integer bit size symbol for optimization of the communications rate (§§ 0033-0035). Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made that the method of Dirschedl in view of Gross and Jones could further be modified to utilize a variable integer bit size symbol for the most efficient bandwidth utilization. According to the teachings of Jones, the comparison of Dirschedl's maximum data rate with the preset threshold would determine if a larger or smaller number of bits per symbol would be utilized. As broadly as claimed, if the maximum data rate is above the threshold, a symbol having a multiple of a predetermined number (i.e. 1) of bits would be chosen (most likely a high number of bits per symbol), and, if the maximum data rate is below the threshold, a symbol having any variable integer number of bits per symbol may be chosen depending upon an optimum bandwidth utilization.

Regarding claim 2, Dirschedl in view of Gross and Jones disclose the limitations of claim 1 as applied above. Further, Dirschedl in view of Gross and Jones disclose that the data rate is obtained from a remote location (DirschedeI; col. 2, line 29).

Regarding claim 3, Dirschedl in view of Gross and Jones disclose the limitations of claim 1 as applied above. Further, Gross discloses that information regarding a data rate is utilized to determine an estimated maximum receive data rate.

Regarding claims 4-6, Dirschedl in view of Gross and Jones disclose the limitations of claim 1 as applied above. Further, the particularly claimed values of



thresholds and numbers of bits per symbol are not claimed as being related to any particular advantage or feature of the invention. None of the claimed values are disclosed as providing any synergistic outcome. Rather, the use of any of the claimed values would lead only to routine and predictable results. Therefore the use of the particularly claimed values (and any others) are considered to be a matter of design choice to be chosen by one having ordinary skill in the art depending upon a desired operation of the system.

Regarding claims 7-12, Dirschedl in view of Gross and Jones disclose the limitations of the claims as applied to claims 1-6 above.

Regarding claim 13, Dirschedl in view of Gross and Jones disclose the limitations of the claim as applied to claim 1 above.

Regarding claim 13, Dirschedl in view of Gross and Jones disclose the limitations of claim 13 as applied above. Further, in the combination of Dirschedl in view of Gross and Jones, the pre-selected number of bits per symbol is not necessarily fixed. However, one skilled in the art would combine the teachings of the references such that high data rates above the threshold would permit symbols having a high number of bits per symbol. Jones discloses, for high rates, the use of symbols having a constellation size of 256 or more (¶ 0035). A constellation size of 256 refers to 8 bits per symbol. 8 is a multiple of 8, 4, and 2.

Regarding claims 15-17, Dirschedl in view of Gross and Jones disclose the limitations of the claim 14 as applied above. Furthermore, the remaining limitations of the claims are considered obvious as applied to claims 4-6 above.

Regarding claim 18, Dirschedl in view of Gross and Jones disclose the limitations of claim 14 as applied above. Further, Dirschedl discloses that the transmissions errors are recorded using the CRC code (col. 2, lines 59-63) and send to the transmitter (col. 2, lines 65-68). As broadly as claimed, the number of transmission errors send by the receiver to the transmitter is considered to be a training signal.

Regarding claim 19, Dirschedl in view of Gross and Jones disclose the limitations of claim 14 as applied above. Further, Dirschedl discloses that the error rate transmitted from the receiver is compared with the threshold (col. 3, lines 13-25). The error rate received from the receiver used to determine an estimate of the maximum receive data rate as taught by Gross. The estimated maximum receive data rate is compared with the threshold.

Regarding claim 20, Dirschedl in view of Gross and Jones disclose the limitations of claim 14 as applied above. Further, the remaining limitations of the claim are disclosed by the combination as applied to claim 1 above.

Regarding claims 21 and 22, Dirschedl in view of Gross and Jones disclose the limitations of claims 1 and 7 as applied above. Further, the remaining limitations of the claim as disclosed by the combination as applied in claim 13 above.

***Allowable Subject Matter***

6. No claims are allowed.

***Conclusion***

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to JASON M. PERILLA whose telephone number is (571)272-3055. The examiner can normally be reached on M-F 8-5 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh M. Fan can be reached on (571) 272-3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Jason M Perilla/  
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August 8, 2008

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